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## DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]Especially this invention relates to a touch sensor and a touch sensor type liquid crystal display about a display device.
[0002]
[Description of the Prior Art]A touch sensor is equipment which detects the position which people's finger or a pen etc. contacted.
Although the thing of the system of former versatility is proposed, a resistance film system and an analog capacitive coupling system of two are in use now.
This touch sensor is laminated by the surface of image display devices, such as CRT and a liquid crystal, for example, is applied to ATM of a bank, and the ticket machine of the station.
[0003]A resistance film system makes the resistance film of two sheets counter, and when the resistance films of the portion which touched with the pen etc. contact, it detects a position. On the other hand, an analog capacitive coupling system detects a position as follows. That is, the conducting film for detecting positions (for example, ITO: indium tin oxide) is formed on a glass substrate, and still more generally an electrode is formed in four corners, and let what distributed low-voltage electric field uniformly on said conducting film from this electrode be a touch sensor. If a finger contacts on a touch sensor, contacting parts will carry out capacitive coupling, and electric field will change, but each inter-electrode resistance of the contacting parts which carried out capacitive coupling, and four corners is proportional to the distance from contacting parts to an electrode. Therefore, in the electrode of four corners, the current proportional to the distance from contacting parts to an electrode will be detected, and the position of contacting parts will be pinpointed based on this current value.
[0004]A linearization pattern is formed in the outer periphery area on a detecting position film in order to make the electric field on a conducting film uniform in this analog capacitive

coupling system. A linearization pattern is a thin film produced by carrying out sputtering of the MoW, for example. The linearization pattern is connected with the external control card through wiring means, such as a flexible printed circuit board (following, FPC) or a cable. Since the linearization pattern was the thin film formed on the glass substrate, the connection between this linearization pattern, and FPC and a cable was not able to perform direct junction by soldering. That is, damage of soldering to glass being impossible, a thin film getting twisted with heating accompanying soldering even if it tries to solder to a thin film directly, or cutting will be received. Therefore, the conventionally following connection methods were adopted.

[0005]First, as a method of using silver paste, as shown in drawing 16 (a), FPC52 is stopped using the silver paste 53, or to the linearization pattern 51 on the glass substrate 50, as shown in the (b), the monotonous terminal 55 is stopped with the silver paste 53, and the cable 54 is soldered to the terminal 55.

[0006]Next, as a method of using an anisotropy electric conduction film (the following, ACF), as shown in drawing 17 (a), As shown in the (b) which stops FPC52 to ACF56 to the linearization pattern 51 on the glass substrate 50, the monotonous terminal 55 is stopped to ACF56, and the cable 54 is soldered to the terminal 55.

[0007]As it is indicated in drawing 18 (a) as the method of using a copper tape, and direct FPC52 is soldered or shown in the copper tape 57 to the linearization pattern 51 on the glass substrate 50 at the (b), the cable 54 is directly soldered to the copper tape 57.

[0008]

[Problem to be solved by the invention]However, the following problems were pointed out to the conventional connection method. Although FPC or a cable may be removed from a glass substrate at the time of repair when a certain failure breaks out while in use, When silver paste is used, since adhesive strength with silver paste, a detecting position film, and a linearization pattern is stronger than adhesive strength with a glass substrate, a detecting position film, and a linearization pattern, If it is going to exfoliate silver paste from a glass substrate, a detecting position film and a linearization pattern will also exfoliate together from a glass substrate. That is, such repair was not able to be carried out. When ACF and a copper tape are used, can once exfoliate from ACF or a copper tape, and the problem of exfoliation of a detecting position film and a linearization pattern can reduce FPC or a monotonous terminal to some extent in that case, but. Even if it pastes up FPC or a monotonous terminal again after exfoliating, problems, like adhesive strength is insufficient and it is are also generated, and it cannot respond to repair enough. This problem is produced also when using a plastic film as a substrate besides a glass substrate.

[0009]When soldering a cable to a monotonous terminal, the linearization pattern might receive the damage to getting twisted with heating at the time of soldering, cutting, etc. Therefore, it had become a factor of the fall of a manufacturing yield, or the fall of the reliability at the time

of product use.

[0010]Therefore, damage to the signal drawer part formed on glass or the display substrate made from a plastic film while attachment work of the invention in this application was simple is not done, And the ** display device which does not make a signal drawer part exfoliate even if it secedes from FPC etc. at the time of repair is offered SUBJECT.

[0011]

[Means for solving problem]Glass or the display substrate made from a plastic film in which the display device of this invention has an image display region, It is a display device provided with the signal drawer part formed in the peripheral edge part of said display substrate, and the contact button electrically connected with said signal drawer part pinching said display substrate.

[0012]The display device of this invention is making composition like a clip so to speak that the contact button 1 pinches glass or the display substrate 2 made from a plastic film, as shown in drawing 1. that is, this contact button 1 -- that gap -- the thickness of glass or the display substrate 2 made from a plastic film -- abbreviated -- since it is equivalent, it can attach easily only by pushing in, where glass or the display substrate 2 made from a plastic film is put at the time of display manufacture. Under the present circumstances, since heat is not applied like the conventional soldering, damage is not done to the signal drawer part 3. Even if it secedes from the contact button 1 for repair, the signal drawer part which is a thin film is not made to exfoliate. and the contact button 1 at the time of the end of repair -- attachment can also be performed very easily again.

[0013]In the invention in this application, a signal drawer part is a concept which does not restrict to said linearization pattern and includes other signal drawer parts. For example, it is possible to apply the invention in this application also to the touch sensor of a resistance film system, and it can be aimed at the parallel pole of the touch sensor of a resistance film system in that case. The combination with the detecting position film of a touch sensor, a parallel pole, and the electrode provided in the corner part may be sufficient as the signal drawer part of the invention in this application, or it could be formed separately from these. The signal drawer part is included what [ not only ] was directly formed on the glass substrate but when the signal drawer part formed by sputtering etc. on the plastic film is carried on a glass substrate. As a plastic film, PET (polyethylene terephthalate) is mainly used and a 100 to about 500-micrometer thing is widely used 10 micrometers - 3 mm especially as thickness.

[0014]FPC and the cable which are connected to a control card, for example can connect with said contact button by soldering or other means. In this case, if a cable is connected to a contact button before pinching a glass substrate for said contact button, compared with the case where it connects after pinching, it excels in connection workability. The thermal effect to a signal drawer part is also avoidable. But an order of this connection work does not specify

the range of the invention in this application.

[0015]Display devices, such as a touch sensor type liquid crystal display, are usually held by the frame prepared separately. Therefore, the electrical link of said contact button and a control card can also be obtained using this frame. That is, the terminal is provided in the position on the contact button which pinches a display device, and said frame which counters, and the terminal provided in this frame and a control card can be made into the electrically connected structure. Thus, if the terminal is arranged on the frame, an electrical link is securable only by building a display device into a frame.

[0016]The form of the contact button which pinches a glass substrate is not limited especially as long as the purpose of the invention in this application can be attained. There is a section horseshoe-shaped contact button as simplest form, and if it is this form, it can arrange to almost all the parts of the periphery of a glass substrate. When a glass substrate is rectangular shape, it can also be considered as the contact button of the core box which has corner shape and the cavity form same in abbreviation. If a glass substrate is pinched so that a corner part may be covered for the contact button of this core box, while the certainty of pinching will improve, there is a gap preventive effect of a contact button.

[0017]As for the connecting face with the signal drawer part in a contact button, in order to secure the certainty of contact, it is effective in a contact button, although a flat surface, i.e., a contact button, and a signal drawer part may be field contact to provide a projection so that it may become point contact.

[0018]What can obtain the function which pinches the conductivity as a terminal and a glass substrate may be sufficient as the construction material of a contact button, for example, publicly known phosphor bronze can be used for it. When manufacturing with a metallic material like the contact button of the aforementioned core box is the form which is not easy, nonmetal materials, such as conductive rubber, may be used.

[0019]There is a touch sensor as a concrete use of the display device in the invention in this application. Although the resistance film system and the analog capacitive coupling system are widely known as a touch sensor as above-mentioned, it is applicable to any of this system.

[0020]A touch sensor may be used combining a liquid crystal display, therefore the display device of the invention in this application is materialized in combination with a liquid crystal display besides a touch sensor panel simple substance. As a combination of a touch sensor panel and a liquid crystal display, the type which laminates a touch sensor panel and a liquid crystal display panel was conventionally standard. However, a touch sensor panel is not laminated to a liquid crystal display panel for the purpose of the small size of a touch sensor type liquid crystal display, and a weight saving, The trial which uses the glass substrate which exists in a liquid crystal display, and gives this the function of the touch sensor of an analog capacitive coupling type or a resistance film system is made. The display device of the

invention in this application is made [ applying to any touch sensor type liquid crystal display of a type, or ].

[0021]The composition at the time of applying the display device of the invention in this application to the touch sensor of an analog capacitive coupling system, It becomes the touch sensor provided with the glass substrate, the detecting position film of the analog capacitive coupling system formed on said glass substrate, the signal drawer part formed outside the detecting position field of said detecting position film, and the contact button electrically connected with said signal drawer part pinching said glass substrate.

[0022]The composition at the time of applying the display device of the invention in this application to the touch sensor of a resistance film system, Glass [ in which the detecting position film and the parallel pole which touches it were formed ], or the 1st electrode plate made from a plastic film, The 2nd electrode plate to which the placed opposite of the field in which the detecting position film and the parallel pole which touches it were formed in, and said detecting position film and parallel pole of this forming face and said 1st electrode plate were formed was carried out with the predetermined gap, It becomes the touch sensor provided with the contact button electrically connected with the parallel pole on said 1st electrode plate, sandwiching said 1st electrode plate. In the touch sensor of a resistance film system, it is not easy for two electrode plates to counter and to be arranged in a detecting position film and a parallel pole, and to be unable to insert a contact button in this gap, since that gap is minute, but for a contact button to sandwich each electrode plate. However, this is a time of two electrode plates being the same size, and if it makes size of the 1st electrode plate larger than the 2nd electrode plate, it can secure the space which a contact button sandwiches in the 1st electrode plate. However, about the 2nd electrode plate, conduction with sandwiching and the exterior can be too carried out with a contact button even in this case. However, if the parallel pole formed in the 2nd electrode plate and the conducting film to conduct are formed on the 1st electrode plate, in the 1st electrode plate, conduction with sandwiching and the exterior is realizable with a contact button.

[0023]The composition at the time of applying the display device in the invention in this application to the type which laminates a touch sensor panel and a liquid crystal display panel among the touch sensor type liquid crystal displays of an analog capacitive coupling system A liquid crystal display, A glass substrate and the detecting position film of the analog capacitive coupling system formed on said glass substrate, The touch sensor of the analog capacitive coupling system which was provided with the signal drawer part formed outside the detecting position field of said detecting position film, and was laminated on said liquid crystal display, It becomes a touch sensor type liquid crystal display provided with the contact button electrically connected with said signal drawer part, pinching said liquid crystal display and said touch sensor. As a display device of the invention in this application which used the glass substrate

which exists in a liquid crystal display, and gave this the function of the touch sensor of an analog capacitive coupling system, The polarizing plate of a couple in which said liquid crystal layer of a liquid crystal layer, the glass substrate of the couple provided in the both sides of said liquid crystal layer, and the substrate of said couple was provided in the field of the opposite hand, The detecting position film of the analog capacitive coupling system formed by uniting with said substrate or said polarizing plate, The touch sensor type liquid crystal display provided with the signal drawer part formed in the outer periphery area on said detecting position film and the contact button electrically connected with said signal drawer part pinching said glass substrate is provided.

[0024]The composition at the time of applying the display device in the invention in this application to the type which laminates a touch sensor panel and a liquid crystal display panel among the touch sensor type liquid crystal displays of a resistance film system, Glass [ in which the liquid crystal display, the detecting position film, and the parallel pole that touches it were formed ], or the 1st electrode plate made from a plastic film, The touch sensor of the resistance film system which a detecting position film and the 2nd electrode plate with which the parallel pole which touches it was formed make carry out the placed opposite of the field in which said detecting position film and the parallel pole were formed with a predetermined gap, and is laminated by said liquid crystal display, It becomes the touch sensor type liquid crystal display provided with the contact button electrically connected with the parallel pole on said 1st electrode plate, sandwiching said liquid crystal display and said 1st electrode plate. The glass substrate which constitutes said liquid crystal display can serve as said 1st electrode plate. That is, although a glass substrate exists in a liquid crystal display as the component, The detecting position film which should be formed in the 1st electrode plate, and the parallel pole which touches it can be formed in that glass substrate, a part of function of a touch sensor can be given, and it can also be considered as the touch sensor type liquid crystal display which carried out the placed opposite of this glass substrate and 2nd electrode plate.

[0025]When a touch sensor and a liquid crystal display are put together, the polarizing plate which is a component indispensable as a liquid crystal display may be arranged on glass or the display substrate made from a plastic film. In that case, it is necessary to make it said polarizing plate not exist in the pinching part of said contact button. That is, although it is common to be provided in the adjacent spaces which are the peripheries of an image display region as for the target signal [ invention in this application ] drawer part, the size of a polarizing plate is larger than an image display region and it is common to make it smaller than said display substrate, it may be set up on a par with said display substrate almost. In this case, the conduction of a contact button and a signal drawer part will be checked as it is. Therefore, said polarizing plate is kept from existing in the pinching part of a contact button. It can be considered that what is fabricated from the beginning in the same form cut or cut the

portion which is specifically equivalent to the pinching part of the contact button of the polarizing plate fabricated by rectangular shape such. Since it must avoid that said contact button exists in an image display region, it is necessary to consider so that it may be arranged within the limits of adjacent spaces.

[0026]It cannot be overemphasized that the limitation about the display device of the invention in this application which explained previously can be added also about these touch sensors and a touch sensor type liquid crystal display here. Although the touch sensor and the touch sensor type liquid crystal display were explained above, this is illustration of the display device of the invention in this application, and it does not mean eliminating other display devices.

[0027]The patent No. 2591081 gazette and a 2726344 gazette has disclosed the technology of using and welding a clip by pressure to the terminal of a display panel, and connection of FCP. However, since this clip does not have the indication about an electrical link with the thin film which does not have a function like a contact button like the invention in this application, and was formed on the glass substrate, this indication technology does not give suggestion to the invention in this application.

[0028]

[Mode for carrying out the invention]Hereafter, the embodiment concerning the invention in this application is described based on an accompanying drawing.

[A 1st embodiment] Drawing 2 - drawing 4 show a 1st embodiment that applied the invention in this application to the touch sensor type liquid crystal display, and are a perspective view, a sectional side elevation, and a lamination explanatory view, respectively.

[0029]The touch sensor type liquid crystal display 10 concerning a 1st embodiment has the structure where the touch sensor panel 11 and a liquid crystal display were laminated, and can classify it into the image display region 10a and the adjacent spaces 10b which enclose it in the surface. The touch sensor panel 11 is an analog capacitive coupling type thing, and as shown in drawing 4, the detecting position film 112 which consists of ITO(s) is formed of sputtering on the glass substrate 111, Furthermore on the detecting position film 112, a MoW film by sputtering is formed as the linearization pattern 113.

[0030]As the liquid crystal display 12 is color TFT-liquid-crystal equipment and it is shown in drawing 4, It has a conventionally publicly known structure where the polarizing plate 120, the glass substrate 121, the light filter 122, the common electrode 123, the liquid crystal phase 124, TFT array 125, the glass substrate 126, the polarizing plate 127, the diffusion sheet 128, and the back light 129 were laminated. Thickness of each layer shown in drawing 4 is not a thing reflecting actual thickness.

[0031]The contact button 13 is arranged at four corners of the touch sensor type liquid crystal display 10. Although the contact button 13 is formed in a corner in this embodiment, the invention in this application cannot be restricted to this, and can be arranged in arbitrary parts,

such as a center section of each neighborhood of the touch sensor type liquid crystal display 10. The contact button 13 consists of phosphor bronze, and has the structure which connected the rectangular upper piece 13a and the lower piece 13b with the side piece 13c as shown in drawing 2. 13 d of projections are formed in the upper piece 13a. The cable 14 for connecting with an unillustrated control card is being fixed to the contact button 13.

[0032]The contact button 13 is pinching the touch sensor type liquid crystal display 10 according to the elastic force, and is similar with the state where a clip has put a component. Since the linearization pattern 113 is electrically connected with the contact button 13 via 13 d of projections in this state, signal transduction to said control card becomes possible. The cable 14 is beforehand connected to the contact button 13 by soldering. Therefore, while excelling in workability compared with a case where it solders after pinching the touch sensor type liquid crystal display 10, there is an advantage which can avoid thermal effect to the touch sensor panel 11 and the liquid crystal display 12.

[0033]In an above embodiment [ 1st ], the form of a contact button can also use a corner part as the contact button 30 of wrap case shape, as shown in drawing 8. This contact button 30 does so the effect that a gap can be prevented while being able to make more reliable pinching of the touch sensor type liquid crystal display 10. The construction material of a contact button may be the rubber containing a conductive substance as well as metallic materials other than the above-mentioned phosphor bronze.

[0034][A 2nd embodiment] Drawing 5 - drawing 7 show a 2nd embodiment that applied the invention in this application to the touch sensor type liquid crystal display, and are a perspective view, a sectional side elevation, and a lamination explanatory view, respectively.

[0035]The lamination of the touch sensor type liquid crystal display 20 concerning a 2nd embodiment is as follows. The liquid crystal layer 207 is arranged between the glass substrate 204 and the glass substrate 209. The glass substrate 204 is called color filter lens, and the glass substrate 209 may be called cell glass. ITO film 206 which are the color filter layer 205 and a common electrode is formed in the liquid crystal layer 207 side of the glass substrate 204. TFT array 208 is formed in the liquid crystal layer 207 side of the glass substrate 209, and the electrode for every pixel is arranged. The polarizing plate 201 is arranged in the liquid crystal layer 207 of the glass substrate 204 in the field of the opposite hand. The polarizing plate 210, the diffusion sheet 211, and the back light 212 are arranged one by one in the liquid crystal layer 207 of the glass substrate 209 in the field of the opposite hand. The thickness of each layer shown in drawing 7 is not a thing reflecting actual thickness.

[0036]Although the above composition is the same as that of the liquid crystal display 12 of a 1st embodiment, a 2nd embodiment is different at the point which forms the detecting position film which is the main components of a touch sensor in the glass substrate which exists in a liquid crystal display. That is, the detecting position film 202 of a 2nd embodiment is formed on

the glass substrate 204. The detecting position film 202 may be formed in the field by the side of the glass substrate 204 of the polarizing plate 201. And the linearization pattern 203 is formed on this detecting position film 202. The contents of the detecting position film 202 and the linearization pattern 203 are the same as that of a 1st embodiment. As mentioned above, since the detecting position film 202 for constituting a touch sensor is formed in the glass substrate 204 which constitutes a liquid crystal display, It is effective in the reduction of the thickness of a liquid crystal display, and weight which it becomes unnecessary to have provided separately the glass substrate for forming the detecting position film 202 therefore, and was provided with the touch sensor function.

[0037]The contact button 21 is arranged at four corners of the touch sensor type liquid crystal display 20. This contact button 21 consists of phosphor bronze, and has the structure which connected the upper piece 21a and the lower piece 21b of the 2 equilateral right triangle with the side piece 21c as shown in drawing 5. 21 d of projections are formed in the upper piece 21a.

[0038]The contact button 21 is pinching the touch sensor type liquid crystal display 20 according to the elastic force, and is similar with the state where the clip has put the component. The linearization pattern 203 is electrically connected with the contact button 21 via 21 d of projections in this state.

[0039]22 is a frame holding the touch sensor type liquid crystal display 20. Drawing 5 shows the state before building the touch sensor type liquid crystal display 20 into the frame 22, and drawing 6 shows the state where the touch sensor type liquid crystal display 20 was built into the frame 22, and was held.

[0040]The frame terminal 221 is arranged at each corner part, and the cable 222 connected with an unillustrated control card is connected to each frame terminal 221 at the frame 22. Since this cable 222 is pulled out from one place of the frame 22 so that drawing 5 may show while it is stored in the frame 22, it excels in handlability. A position of the contact button 21 which is pinching the touch sensor type liquid crystal display 20, and the frame terminal 221 arranged at the frame 22 is set up it be in agreement in the state where it was held at the frame 22, in the touch sensor type liquid crystal display 20. Therefore, conduction of the contact button 21 and the exterior can be planned only by building the touch sensor type liquid crystal display 20 into the frame 22.

[0041]In this embodiment, although the polarizing plate 201 is arranged in the outermost surface of the touch sensor type liquid crystal display 20, the four corners are cut only the upper piece 21a of the contact button 21, and an isomorphism-like part. Therefore, even if the polarizing plate 201 is arranged in the outermost surface of the touch sensor type liquid crystal display 20, the linearization pattern 203 is exposed out of the polarizing plate 201 (refer to drawing 6 and drawing 7). And if the corner part concerned of the touch sensor type liquid

crystal display 20 is pinched with the contact button 21, it will electrically connect with the exposed linearization pattern 203.

[0042]The display surface of the touch sensor type liquid crystal display 20 is classifiable into the image display region 20a which displays a picture, and the adjacent spaces 20b which are the periphery. The contact button 21 which said linearization pattern 203 is formed in these adjacent spaces 20b, and pinched the touch sensor type liquid crystal display 20 is settled in [ 20b ] adjacent spaces. If this assumes that the upper piece 21a of the contact button 21 is not a triangle but a square, for example, the upper piece 21a of the contact button 21 will march out to the image display region 20a. Such [, of course ] a state is not allowed on a product design. Narrow-width-ization of the adjacent spaces 20b is strongly demanded for the miniaturization of a liquid crystal display, and this can be called important technical problem. If the size of the contact button 21 is made small, such a situation is avoidable, but if it does so, it will become difficult to collateralize the function to pinch the touch sensor type liquid crystal display 20 of the contact button 21. Therefore, if premised on arranging the contact button 21 at a corner, circuit assurance with the linearization pattern 203, the pinching function of the touch sensor type liquid crystal display 20, and in order to secure narrow-width-ization of the adjacent spaces 20b further, triangular shape may be adopted like this embodiment.

[0043]In an above embodiment [ 2nd ], the locating position of the frame terminal 221 of the frame 22 can also be used as the bottom, as are shown in drawing 6 and it is shown not only in the side of the frame 22 but in drawing 9. The locating position of the contact button 21 may not be restricted to a corner part, and may be what kind of other positions.

[0044][A 3rd embodiment] Drawing 10 - drawing 13 show a 3rd embodiment that applied the invention in this application to the touch sensor type liquid crystal display, As for the figure and drawing 12 for which the state drawing 10 removed the exploded view and excluding [ drawing 11 ] the upper electrode board is shown, respectively, the A-A sectional view of drawing 11 and the (b) of an assembly figure and drawing 13 (a) are the B-B sectional views of drawing 12. Hereafter, a 3rd embodiment is described based on drawing 10 - drawing 13. The touch sensor type liquid crystal display 30 concerning a 3rd embodiment is a thing of the type which laminated the touch sensor panel 31 and the liquid crystal display 32 of the resistance film system. Since the composition of the liquid crystal display 32 is the same as that of a 1st embodiment, the explanation about the lamination is omitted here.

[0045]The touch sensor panel 31 consists of the upper electrode board 311 and the lower electrode plate 312 with larger size than the upper electrode board 311. And the upper electrode board 311 forms the upper resistance film 311b which consists of ITO films in the rear face in a figure of the upper sheet board 311a which consists of plastic films, and the Kamihira line electrode 311c which consists of silver paste in contact with this upper resistance film 311b is formed. And the Kamihira line electrode drawer part 311d is pulled out from the

Kamihira line electrode 311c, respectively.

[0046]The lower electrode plate 312 forms in the surface of the glass lower glass substrates 312a the lower resistance film 312b which consists of ITO films, and the Shimohira line electrode 312c is formed in contact with this lower resistance film 312b. And the lower electrode signal drawer part 312d is pulled out from the Shimohira line electrode 312c, respectively. The upper electrode signal drawer part 312e is formed in the lower glass substrate 312a surface. The Shimohira line electrode 312c, the lower electrode signal drawer part 312d, and the upper electrode signal drawer part 312e can consist of the same silver paste as the Kamihira line electrode drawer part 311d.

[0047]The above upper electrode board 311 and lower electrode plate 312, A predetermined gap is separated with the spacer 313, it is arranged, and the touch sensor panel 31 is constituted so that the upper resistance film 311b and the lower resistance film 312b may counter, and so that the Kamihira line electrode 311c and the Shimohira line electrode 312c may go direct (drawing 13 (a)). And this touch sensor panel 31 and liquid crystal display 32 laminate, and the touch sensor type liquid crystal display 30 of this embodiment is constituted.

[0048]In this embodiment, the contact button 33 to which the cable 34 was connected is in the portions of the lower electrode signal drawer part 312d and the upper electrode signal drawer part 312e, and sandwiches the lower electrode plate 312 and the liquid crystal display 32. The composition of the contact button 33 is the same as that of a 1st embodiment. Although the A-A section of drawing 11 is shown in drawing 13 (a), the Shimohira line electrode 312c, the lower electrode signal drawer part 312d, and the contact button 33 conduct. Although the B-B section of drawing 12 is shown in drawing 13 (b), Since ACF(anisotropy electric conduction film) 314 is made to intervene between the Kamihira line electrode drawer part 311d of the upper electrode board 311, and the upper electrode signal drawer part 312e of the lower electrode plate 312, The Kamihira line electrode 311c, the Kamihira line electrode drawer part 311d, ACF314, the upper electrode signal drawer part 312e, and the contact button 33 will conduct. Here, since the lower electrode signal drawer part 312d and the upper electrode signal drawer part 312e will hide between two-electrodes boards and will not be outside exposed supposing the upper electrode board 311 and the lower electrode plate 312 are the same size, it cannot sandwich with the contact button 33. However, since the upper electrode board 311 was made smaller than the lower electrode plate 312 in this embodiment, the lower electrode signal drawer part 312d and the upper electrode signal drawer part 312e could be exposed outside, and it made it possible to sandwich this with the contact button 33.

[0049]In the above touch sensor type liquid crystal display 30, if the upper electrode board 311 is pushed and the lower electrode plate 312 is contacted, it will be in an ON state. If the voltage E is impressed between the Shimohira line electrodes 312c here, an electric potential gradient will be made inter-electrode. Since resistance of the lower resistance film 312b is

uniform, an electric potential gradient serves as a straight line, and relation between distance and voltage becomes a linear expression. A position of an X axial direction of a point of contact can be computed by the Kamihira line electrode 311c detecting the voltage Ec of a point of having inputted, and making this into a digital value with an A/D converter. Next, the voltage E is impressed to the Kamihira line electrode 311c, the Shimohira line electrode 312c detects the voltage Ec, and a position of Y shaft orientations of a point of contact is computed similarly. If this is repeated in a short-time cycle in a time sharing circuit, a position of a point of contact can be searched for momentarily. The above is a detecting position principle of a touch sensor of a resistance film system.

[0050]According to an above embodiment, a cash-drawer end of the lower electrode signal drawer part 312d and the upper electrode signal drawer part 312e is formed in a center section of each neighborhood of the lower glass substrate 312a. However, as shown in drawing 14, the lower electrode signal drawer part 312d and the upper electrode signal drawer part 312e can be extended, one side can be gathered, and it can also sandwich with a contact button there.

[0051]Although an above embodiment explained an example of combination with a liquid crystal display, it cannot be overemphasized that the invention in this application is materialized in a touch sensor panel independent. In that case, a contact button will sandwich only a lower electrode plate. It cannot be overemphasized that it can support with same frame with a 2nd embodiment having shown. Although a touch sensor panel and a liquid crystal display were prepared separately and a type which laminated it was explained by an above embodiment, a glass substrate which exists in a liquid crystal display can also be used as a touch sensor type liquid crystal display used as a lower electrode plate like a 2nd embodiment. That is, since a lower glass substrate which constitutes a lower electrode plate can be excluded if an element which constitutes lower electrode plates, such as a lower resistance film and the Shimohira line electrode, is formed on a glass substrate which exists in a liquid crystal display, it is advantageous to a weight saving and slimming down.

[0052]Drawing 15 is a figure showing the example, and is a sectional view corresponding to drawing 13. In drawing 15, the lower resistance film 42b, the Shimohira line electrode 42c, the lower electrode signal drawer part 42d, and the upper electrode signal drawer part 42e are formed on the glass substrate 42a as a light filter which constitutes the liquid crystal display 42. Since composition of a liquid crystal display except the glass substrate 42a is the same as that of a 1st embodiment, the specific constitution has been omitted here. The placed opposite of the upper sheet board 41a with which the upper resistance film 41b, the Kamihira line electrode 41c, and the Kamihira line electrode drawer part 41d were formed via the spacer 413 on it is carried out, and the polarizing plate 423 is further arranged on it. ACF(anisotropy electric conduction film) 414 is made to intervene between the Kamihira line electrode drawer

part 41d and the upper electrode signal drawer part 42e. The contact button 43 to which the cable 44 was connected is pinching the liquid crystal display 42, making electric connection with the lower electrode signal drawer part 42d and the upper electrode signal drawer part 42e. Other composition is the same as that of a 3rd embodiment.

[0053]In the example shown in the above drawing 15, the glass substrate 42a of the liquid crystal display 42, And the lower resistance film 42b and the Shimohira line electrode 42c which were formed in the surface can exclude the lower glass substrate which will serve as the function as a lower electrode plate of the touch sensor panel 41, therefore constitutes a lower electrode plate. You may make it the polarizing plate 423 located between the glass substrate 42a and the lower resistance film 42b in the above-mentioned embodiment.

[0054]

[Effect of the Invention]According to the invention in this application, the effect of not making a signal drawer part exfoliate, even if damage to the signal drawer part formed on the glass substrate is not done and it secedes from FPC etc. at the time of repair, while attachment work is simple is done so like explanation above.

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[Translation done.]